

ABSTRACT**“A Wireless Communication Apparatus and Method”**

A method and apparatus for achieving combined beamforming and transmit diversity for frequency selective fading channels in a communication system having a base station with multiple transmit antennae and a mobile terminal with at least a single receive antenna, the method comprising the steps of: providing a signal to be transmitted; space-time encoding the signal to produce at least two separate signals, each on a respective output; feeding each output signal to a multiple access transmit processor to produce an output signal; applying respective selected transmit beamforming weights to each output signal; feeding the respective weighted signals to a signal combiner to perform a summing function of the signals and produce a signal for transmission; feeding the summed signal to each of the multiple transmit antennae for transmission; transmitting the signals over respective physical channels; receiving the transmitted signal at at least a single receive antenna; feeding the transmitted signal to a multiple access receive processor to produce an output signal; and space-time decoding the received signal.

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